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"Rhætic Plants from Honduras."—*Amer. Jour. Sci.* xxxvi. 342 (1888).

"The Laramie Group. Its Geological Relations, its Economic Importance and its Fauna and Flora."—*Trans. N. Y. Acad. Sci.* ix. 6 (1889).

"The Flora of the Great Falls Coal Field, Montana."—*Amer. Jour. Sci.* (III.) xli. 191–201, Pl. XIV. (1891).

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Death of Isaac C. Martindale.

The readers of the BULLETIN will receive with deep sorrow the news of the sudden death of Isaac C. Martindale from apoplexy, at his home, No. 322 Penn street, Camden, N. J.

Mr. Martindale was born in Byberry, Philadelphia county, Pa., July 15, 1842. His parents were members of the Society of Friends, and his early education was acquired chiefly in schools under their control. His father was a descendant of John Martindell, who early settled in Bucks county, Pa. Many of the family have become prominent in the history of that region. His ancestry on both sides had shown literary ability which he inherited, while there was also in him an inherent love for nature. He began the study of natural history while on his father's farm, and in spite of lack of books he acquired considerable scientific knowledge in all its departments. He left the farm to become a clerk in a bank at Byberry. In 1875 he was appointed Cashier of the National State Bank of Camden, the duties of which he performed with great fidelity. A few years ago some of his friends established the Camden National Bank, the cashiership of which was confided to him. He had been for the last three years Treasurer of the Academy of Natural Sciences in Philadelphia, a position in which his financial ability made him eminently useful.

The study of botany, in whatever hours he could snatch from his daily duties, was to him a welcome relaxation. He early made himself acquainted with the plants in the vicinity of Byberry. A

short tour in Europe in which his eyes were delighted by the mountain Flora of Switzerland, and during which he made considerable collections, enabled him to lay a foundation for that extensive Herbarium which was to be his chief life-work. After his removal to Camden, his close proximity to the rich and peculiar Flora of the "Jersey Pines" opened to him a new and most fascinating field, in the study of which he profited by the companionship and accurate local knowledge of the lamented Charles F. Parker. From that time onward, with most assiduous effort, most untiring industry, and with large pecuniary outlay, he devoted himself to the increase and perfection of an Herbarium which has few, if any rivals among the private collections in the land.

He published in November, 1879, in the *American Naturalist*, a list of plants collected on an excursion of some members of the American Association for the Advancement of Science to the vicinity of Pike's Peak in 1878, with critical notes on various species. In 1880 he read before the West New Jersey Surveyors' Association a paper entitled "Notes Upon the Bartram Oak" (*Quercus heterophylla*), with a summary of the literature concerning that mooted form. He published in the proceedings of the Philadelphia Academy for 1880, a short paper on "Sexual Variations in *Castanea Americana*." He also prepared a most valuable "list of the marine algæ hitherto observed on the coasts of New Jersey and Staten Island," which was published in the first volume of the *Memoirs of the Torrey Club*. For the proceedings of the Philadelphia Academy for November, 1883, he furnished a very just and feeling biographical sketch of his friend Charles F. Parker, who had died the previous September.

Although botany may be said to have been Mr. Martindale's chief love among the sciences, and that to which he had mainly devoted himself, it was by no means his exclusive hobby. Entomology received a large share of his attention, and as early as 1863 he was elected a corresponding member of the American Entomological Society. During his last years he devoted himself largely to the study of Lepidoptera, and had made a collection which experts in that department have pronounced as very nearly the finest in America. He was much interested in meteorology, and was for a time one of the observers for the Smithsonian In-

stitute, and had given much labor to the investigation of the history of his native own (Byberry), and to the study of his family genealogy.

It is remarkable that a man burdened with such exacting and responsible business cares, should have been able to accomplish so much in what were to him mere avocations, and botanists cannot help recalling the similar instances of Dr. Wm. Darlington and David Townsend, of West Chester, Pa., both bank officers, and both most ardent and successful botanists. And yet it is to be feared that Mr. Martindale overtaxed his strength, and perhaps had he shortened his hours of labor he might have been spared to the world for many years longer. Symptoms of failing health had led him to resign his position, within a week or two before his death, in order that he might find resoration by travel, and he had intended a visit to South America.

J. H. REDFIELD.

Anatomy as a Special Department of Botany.*

BY EMILY L. GREGORY.

The question of the exact limitation and relative importance of the various departments of botany is by no means a simple one. To verify this assertion it is necessary only to consider briefly the definitions given by some of the best writers of botanical text books. In our own country there is perhaps no higher authority than that of Asa Gray, who in his text book of 1857 says: Physiology is the study of the way a living being lives and grows and performs its various operations. The study of plants in this view is the province of Vegetable Physiology. The study of the form and structure of the organs or parts of the vegetable by which its operations are performed, is the province of Structural Botany. The two together constitute Physiological Botany," &c. The title page of the same book is headed "Gray's Lessons in Botany and Vegetable Physiology," and again in the text we find "Botany is the name of the science of the vegetable kingdom in general."

* Read before the American Association for the Advancement of Science, Rochester Meeting, 1892.